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## EDUCATION FOR VOCATIONAL EFFICIENCY

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During the past year there have come from the American press two volumes which should be peculiarly welcome to those interested in the formulation of an adequate policy of training for vocational efficiency, for they are both reports of exhaustive inquiries into the functioning of our economic institutions. Although vocational efficiency is quite generally regarded as one of the more important educational objectives, these reports have received no attention in our professional educational journals. This is the more surprising in view of the greatly increased emphasis given to the attainment of this objective in recent years.

One<sup>1</sup> of these volumes reports the facts, as accurately as they could be ascertained, regarding the amount and distribution of income in the United States from 1909 to 1918 inclusive. This is the first of a series of investigations "into subjects that affect public welfare" to be conducted "under the auspices of the National Bureau of Economic Research, an institution which is composed of nineteen directors who represent a wide variety of economic interests and points of view." The stated object of the investigation was "to learn whether the national income is adequate to provide a decent living for all persons, whether this income is increasing as rapidly as the population, and whether its distribution among individuals is growing more or less unequal."

The second volume<sup>2</sup> contains a report on waste in American industry by a committee of the Federated American Engineering Societies. This committee was appointed in January, 1921, by Herbert Hoover, who at that time was president of the organization.

<sup>1</sup> W. C. Mitchell, F. R. Macaulay, W. I. King, and O. W. Knauth, *The Income in the United States*. New York: Harcourt, Brace & Co., 1921. Pp. xvi+152.

<sup>2</sup> Committee on Elimination of Waste in Industry of the Federated American Engineering Societies, *Waste in Industry*. New York: McGraw-Hill Book Co., 1921. Pp. xii+409.

The investigation was begun almost immediately and by intensive work was carried through to completion within a period of five months. The report covers six industries, namely, the boot and shoe, building, men's ready-made clothing, metal, printing, and textile manufacturing. Four other industries were included in the original plan but for various reasons were dropped from the investigation before completion.

Each of these reports contains much that deserves the thoughtful consideration of educators, for in each is found a partial measure of our vocational efficiency. But what is meant by vocational efficiency? A clear, searching, and comprehensive answer to this question is seldom found in educational discussions. It is too often taken for granted that, if we train carpenters, weavers, compositors, machinists, and engineers in the narrower aspects of their respective callings, we shall become vocationally efficient. It will be well, therefore, first, to arrive at an understanding of what vocational efficiency must involve; then, to examine these reports in the light of this understanding; and, finally, to suggest the bearing of all of this on the formulation of an adequate policy of vocational education.

#### MEANING OF VOCATIONAL EFFICIENCY

In some quarters vocational efficiency is apparently regarded as something to be described without reference to human values. Its chief attribute is mechanical perfection, the working of part on part without friction or unnecessary dissipation of energy. This is judged an unqualified good, something requiring no external justification. Thus is built up a system of vocational relations, isolated from the rest of life and governed by a scale of values generated by its own activities.

With this conception of vocational efficiency we, of course, cannot agree. And it is perhaps true that it has few conscious supporters anywhere; but the number unconsciously committed to it is legion. This is apparently due to the common failure to make a complete analysis. Certainly, vocational efficiency of this order is not something to be desired for its own sake by the great mass of folk who work in industry, although it is conceivable that to the outsider the whole might present a pleasing picture or afford a spectacle at which to marvel. On the contrary, it is to

be desired only in so far as it contributes to the satisfaction of human needs and the realization of human purposes.

What, then, is the measure of vocational efficiency? To this question there are several answers. Some would say that the aggregate quantity of goods and services produced by a people is an adequate measure of their vocational efficiency. Others would hold that the only satisfactory criterion is to be found in the general material well-being of a people, in the extent of the diffusion of wealth throughout the population. And yet others would maintain that genuine vocational efficiency means the conservation of resources, both human and natural, and the organization of the occupational life so as to make it both interesting and educative as well as remunerative in the narrower sense of the term. Each of these conceptions will be briefly examined.

The first is a very crude and uncritical measure of vocational efficiency, although it is apparently accepted as adequate in many of the programs for vocational education which are finding their way into our schools today. A great aggregate production of wealth by a people is not in itself sufficient cause for genuine satisfaction, since an exceptionally high total production is not incompatible with actual poverty and economic misery among vast elements of the population. Huge bank clearings and numerous trade transactions may denote a degree of economic activity and may serve for advertising purposes; but they may leave the mass of the people in a position of economic insecurity. Such spectacular exhibits are not enough. Of course, in so far as an individual participates intelligently in a great collective enterprise he may derive considerable satisfaction from the activity itself and even from the contemplation of collective achievement, regardless of the nature of the material reward accompanying such participation. A member of a social group naturally takes pride in the successes of that group. He lives and moves in the reflected glory of group accomplishment. We like to hear that five-sixths of the world's corn crop is grown in the United States, even though it does not reduce the price of bread. Likewise, we are thrilled when someone reminds us that the world's financial center has shifted from London to New York City, although it may not lift a mortgage. But it is difficult to stress this type of intangible and immaterial compensa-

tion in an economic system which revolves about competition for pecuniary rewards.

The second criterion of vocational efficiency recognizes the supreme importance of the distribution of wealth and income. According to this conception, the economic system cannot be regarded as efficient unless it raises the great mass of the people well above the level of actual want, unless there is general participation in an abundance of those goods and services which constitute the material basis of civilization. Certainly this is the fundamental purpose of vocation. A decent standard of living for all should be the first charge on human industry. We may say that vocation should also serve other and more idealistic ends, such as those to be mentioned in the succeeding paragraph; but if it does not at least provide the necessities, as well as some of the comforts, of life, vocation should be regarded as failing to perform its most essential function. This is the perfectly obvious and common-sense view. Consequently any scheme of training for vocational efficiency that does not take its departure from this point and does not constantly return to it for a measure of success, is bound to be abortive.

According to the third criterion, a people, in order to lay claim to vocational efficiency, must not only present evidence of a wide diffusion of material prosperity but also show such an organization and functioning of industry as to insure the conservation of both natural and human resources. It must even order its occupational life so as to make vocation itself a great educational enterprise in which the individual worker may find opportunity for self-realization and personal growth. The humanity of this conception makes a fundamental appeal; and its wisdom in guarding the more permanent interests of society is obvious. But the goal is raised so high that it is not easy to imagine the road that leads from our present economic system to it. We shall, therefore, be content here with an examination of our present vocational status from the standpoint of the second and less exacting criterion.

#### INCOME AND ITS DISTRIBUTION

Assuming, then, that the maintenance of a decent standard of living for the great mass of the people is the first measure of vocational efficiency, it is appropriate now to direct our attention to the

report on income in the United States. Here we find relatively accurate estimates of our aggregate national income and its distribution, as well as comparative data from other countries.

In Table I is given the estimated annual per capita income in

TABLE I\*

ESTIMATED PER CAPITA INCOME IN DOLLARS FOR EACH OF  
TEN COUNTRIES AT THE OUTBREAK OF THE WAR  
IN 1914

United States.....	\$335
Australia.....	263
United Kingdom.....	243
Canada.....	195
France.....	185
Germany.....	146
Italy.....	112
Austria-Hungary.....	102
Spain.....	54
Japan.....	29

\* Adapted from Mitchell, Macaulay, King, and Knauth, *op. cit.*, p. 85.

dollars for each of ten countries at the outbreak of the war in 1914. The United States clearly heads the list. If we were to accept this measure of aggregate income as a satisfactory criterion of vocational efficiency, we would easily be the most efficient people among the great nations of the world. At the time of this estimate our total annual income amounted to approximately \$335 for every man, woman, and child in the nation, while the corresponding figure for our nearest competitor, the commonwealth of Australia, was but \$263. Some of the differences are probably accounted for by the greater value of the dollar in some of the other countries, but this would not make necessary any important shift in our relative position. It would cut down our lead with respect to certain nations, but nothing more.

Since the study covers a ten-year period, the facts for the different years should be presented. Table II gives the per capita income in the United States in dollars for each year from 1909 to 1918, inclusive. It will be observed that this figure rises from \$319 in 1909 to \$586 in 1918; but a large part of this apparent increase of income is due to changes in price levels. In order, therefore,

to determine the extent of the advance in real income the estimate for each year is restated in terms of its purchasing power at the price level of 1913. A glance at this column of figures shows that there was comparatively little change in real income during the period. The fact, however, that it did actually increase suggests that the income is more than keeping pace with the growth of population. But it should not be overlooked that the fluctuations from year to year indicate that this increase is probably a function of temporary economic conditions caused by the war rather than a permanent gain due to improved efficiency. Facts for the depression years through which we are now passing would probably show a return to the level of 1909, if not to a lower level.

TABLE II\*  
ESTIMATED PER CAPITA INCOME IN THE UNITED STATES  
FROM 1909 TO 1918, INCLUSIVE, AND ITS PURCHASING  
POWER AT THE PRICE LEVEL OF 1913

Year	Per Capita Income	Purchasing Power at Price Level of 1913
1909.....	\$319	\$333
1910.....	340	349
1911.....	333	338
1912.....	346	348
1913.....	354	354
1914.....	335	333
1915.....	358	350
1916.....	446	400
1917.....	523	396
1918.....	586	372

\* Adapted from Mitchell, Macaulay, King, and Knauth, *op. cit.*, p. 76.

The foregoing facts, so far as they go, indicate that the American people are vocationally efficient according to the first criterion. The annual per capita income is appreciably greater in the United States than in any other large country; and this amounted to \$586 in 1918. Thus, if the national income had been equally distributed, a family of five would have received \$2,930, which would undoubtedly have been adequate to maintain a decent standard of living. But income is not equally distributed. Let us, therefore, pass to an examination of the data bearing on this question.

A percentage analysis of the distribution of 37,569,060 incomes in 1918 is presented in Table III. The incomes of approximately 2,500,000 soldiers, sailors, and marines are not included in this analysis, because they are not representative of normal economic conditions and would give an unnatural distribution. In the table is a simple distribution, giving for each income class the percentage of the total number of persons receiving incomes within that particular range and the percentage of the total income which they received. Thus, .5324 per cent actually lost money during this year, having negative incomes amounting to .22 per cent of the total; 4.8645 per cent received incomes ranging from \$1 to \$500, which equalled 1.18 per cent of the total, and so on. The table also presents a cumulative distribution of the percentage of the total number of persons who received incomes in and under each class of income, as well as corresponding percentages for the total income. Thus, proceeding to the fourth item from the top in this array of figures, we find that 72.0176 per cent of the total number of persons gainfully employed received 44.30 per cent of the total income. The remainder of this section of the table is understood if read in the same way.

Table III shows great inequalities in the distribution of incomes. The range is from actual loss to individual incomes of millions; but the number at either extreme is not large. More significant is the fact that almost 39 per cent of the incomes are under \$1,000, and that nearly 86 per cent are under \$2,000. Of course, many of the small incomes go to minors and women who, in most cases, are not bearing the heavy burdens of family support, but it is quite impossible to explain all such incomes in this fashion.

An examination of the three more common measures of central tendency is of interest here. The arithmetic average is \$1,543; the median, \$1,140; and the mode, \$957. In a perfectly normal distribution these three measures should be identical. The distribution of income is, therefore, obviously far from the normal. This departure is due to an excessive number of very small incomes and a considerable number of extraordinarily large incomes. The small incomes pull the mode and the median to the lower end of the distribution and the large incomes pull the average to the upper end.



Two other measures should be observed in this connection, namely, the lower and upper quartiles, which give the range of the middle 50 per cent of the distribution. The former is \$833, and the latter, \$1,574. These two measures mean that one-fourth of the personal incomes in the United States are below \$833, and three-fourths are below \$1,574. Since the arithmetic average is approximately the same as the upper quartile, it is clear that the most prosperous 25 per cent receive an aggregate income equal to that of the remaining 75 per cent.

TABLE III\*

PERCENTAGE ANALYSIS OF THE DISTRIBUTION OF 37,569,060 INCOMES IN 1918†

INCOME CLASS	SIMPLE DISTRIBUTION		CUMULATIVE DISTRIBUTION	
	Persons	Income	Persons	Income
\$0 or less. . . . .	.5324	— .22	.5324	— .22
\$1-\$500. . . . .	4.8645	1.18	5.3969	.96
\$501-\$1,000. . . . .	33.3537	16.94	38.7506	17.90
\$1,001-\$1,500. . . . .	33.2670	26.40	72.0176	44.30
\$1,501-\$2,000. . . . .	13.8999	15.39	85.9175	59.69
\$2,001-\$3,000. . . . .	8.1584	12.62	94.0759	72.31
\$3,001-\$5,000. . . . .	3.6817	8.93	97.7576	81.24
\$5,001-\$10,000. . . . .	1.5646	6.79	99.3222	88.03
\$10,001-\$25,000. . . . .	.5112	4.85	99.8334	92.88
\$25,001-\$50,000. . . . .	.1094	2.41	99.9428	95.29
\$50,001-\$100,000. . . . .	.0373	1.64	99.9801	96.93
\$100,001-\$200,000. . . . .	.0132	1.16	99.9933	99.09
\$200,001-\$500,000. . . . .	.0053	.98	99.9986	99.07
\$500,001-\$1,000,000. . . . .	.0010	.38	99.9996	99.45
\$1,000,001 and over. . . . .	.0004	.55	100.0000	100.00
Total. . . . .	100.0000	100.00	.....	.....

\* Adapted from Mitchell, Macaulay, King, and Knauth, *op. cit.*, p. 137.

† Approximately 2,500,000 soldiers, sailors, and marines excluded from the analysis.

The following summary statement from the report merits quotation.

Data regarding the detailed distribution of personal incomes are scanty and difficult to systematize; but the best approximation this bureau has been able to make indicates that in 1918, the most prosperous 1 per cent of the income receivers had nearly 14 per cent of the total income, the most prosperous 5 per cent of the income receivers had nearly 26 per cent of the total, the most prosperous 10 per cent of the income receivers had nearly 35 per cent of the total, and the most prosperous 20 per cent of the income receivers had about 47 per cent of the total income.<sup>1</sup>

<sup>1</sup> Mitchell, Macaulay, King, and Knauth, *op. cit.*, p. 147.

This analysis raises certain doubts concerning our vocational efficiency, as judged by the second criterion. The exceptionally large aggregate income makes a very favorable impression; but the distribution of that income may be cause for serious misgiving. At least, it suggests the unwisdom of adopting an attitude of complacency. In 1918, a year in which the "normal" inequalities were probably somewhat diminished, because of an unusual combination of circumstances, into a consideration of which we cannot go here, over three-fourths of the recipients of incomes received less than \$1,600. This brings us to the heart of the matter. Is the income actually received under existing conditions of distribution adequate to maintain a decent standard of living for the great masses of the people? We shall now seek an answer to this question.

#### INCOME AND AN ADEQUATE STANDARD OF LIVING

In recent years there have been various studies of the standard of living. Some of these have sought to determine the pauper level; others, the minimum of subsistence level; and yet others, the minimum of health and comfort level. It is this third type of estimate in which we are interested here, since no economic system can be thought efficient which does not provide a standard of living at least as high as this. We find such an estimate in a study made by the United States Bureau of Labor Statistics in the city of Washington, D.C., for the month of August, 1919.<sup>1</sup>

The object of this investigation was to determine the "tentative quantity and cost budget necessary to maintain a family of five . . . at a level of health and decency." In more exact terms, this means a standard of living slightly higher than "that of subsistence, providing not only for the material needs of food, shelter, and body covering, but also for certain comforts, such as clothing sufficient for bodily comfort and to maintain the wearer's instinct of self-respect and decency, some insurance against the more important misfortunes—death, disability, and fire—good education for the children, some amusement, and some expenditures for self-development."<sup>2</sup> This certainly does not suggest extravagant expenditure.

<sup>1</sup> *Tentative Quantity and Cost Budget Necessary to Maintain a Family of Five in Washington, D.C.* Washington, D.C.: Government Printing Office, 1919.

<sup>2</sup> *Ibid.*, p. 5.

The budget finally adopted for the average family of five, consisting of husband, wife, and three children below the age of fourteen years, is as follows:<sup>1</sup>

Food. . . . .	\$ 773.93
Clothing. . . . .	513.72
Housing, fuel, and light. . . . .	428.00
Miscellaneous. . . . .	546.82

Total budget at market prices (August, 1919). . . . .	\$2,262.47
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Possible saving upon market cost by a family of extreme thrift, of high intelligence, great industry in shopping, good fortune in purchasing at lowest prices, and in which the wife is able to do a maximum amount of home work. . . . .	\$ 246.91
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Total budget minus economies. . . . .	\$2,015.56
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Let us now turn back to an examination of the distribution of income to discover its adequacy to maintain this standard of living. We find that only about 10 per cent of the recipients of income in 1918 would have been able to maintain a family of five on this minimum level of health and decency without resorting to the most extraordinary economies. But let us assume these economies and accept \$2,000 as the minimum income for a family of this size. The situation is but little improved. Almost 86 per cent of the incomes fell below this level, while less than five and one-half million persons received incomes of more than \$2,000. After making full allowance for higher living costs in Washington than in many other parts of the country, for the large number of income receivers who do not have to support families of five, and for various errors that creep into estimates of this character, it is altogether clear that vast elements in our population are living on a level far below the minimum for health and decency. Not only that, but many are actually living on the pauper and poverty levels. This is the condition that exists in the richest country in the world, a country favored above all others by a bountiful nature, a country that prides itself on its vocational efficiency. It exists in spite of an era of unprecedented mechanical invention, of an almost miraculous mastery of natural forces, of a huge accumulation of capital and the tools of production, and of an enormous increase of wealth. Is this condi-

<sup>1</sup> *Op. cit.*, p. 10.

tion inevitable? Must great masses of people live in continual want in the presence of plenty? Must the poor remain always with us? These are basic questions to be considered in the formulation of any policy of vocational education.

From many quarters has come the suggestion that the only solution is to be found in greater equality in the distribution of income. Let us, therefore, assume for the moment complete equality in this respect. Would this make possible the maintenance of a decent standard of living? As pointed out in an earlier paragraph, under these conditions, a family of five would have received \$2,930 in 1918. This would have raised the entire population well above the minimum level for health and decency. That complete equality of income would, for many reasons, be undesirable at any time and under any conditions is possibly true; and that such a program would be an impossible and impractical one for the present is certainly true. Consequently, there is no suggestion here that educators should immediately advocate the complete equalization of income, but it is obvious that a policy of vocational education that interests itself in production alone, giving no attention to the equally important question of distribution, is a one-sided policy. In the writer's opinion, there is little justification, either in ethics or in economics, for the present distribution of income. Greater equality is desirable. It is doubtful, however, if present production, under the condition of complete equality of distribution, can banish poverty and a low standard of living and at the same time provide sufficient savings for the necessary renewal and increase of capital. Production must, therefore, be increased.

#### WASTE IN INDUSTRY

To what extent can production be increased? How great is the remedial waste in American industry? How is the responsibility for this waste to be apportioned among the various factors that guide industry and influence production? What are the particular causes of this waste? And, finally, is a higher standard of living clearly within the realm of the possible? To each of these questions the committee of the engineering societies has given at least a partial or tentative answer. Let us examine them in turn.

In undertaking the estimation of waste in American industry the committee adopted no criterion of perfection. In their own words,

No attempt has been made to write an academic definition of waste or to speculate in regard to ultimate savings. For the purpose of this report no attempt has been made to consider all economic wastes. Rather . . . industrial waste has been thought of as that part of the material, time, and human effort expended in production represented by the difference between the average attainments on the one hand and performance actually attained on the other, as revealed by detailed reports. . . . Thus it has established no theoretical standard of performance or excellence, but has developed a method of measurement to determine the degree of effective use of those factors within which it was believed waste might be discovered. It has conceived that a given practice is not wasteful until a better has been revealed, and that the value of a newer practice, or the amount by which it is an improvement over an earlier one, can only be determined by units and methods of measurement.<sup>1</sup>

In accordance with this principle, the committee studied and estimated the extent of waste in six industries. Taking 100 points as a theoretical total to represent complete waste, they arrived at the results presented in Table IV. "As no plant is or could be

TABLE IV\*

EXTENT OF WASTE IN SIX AMERICAN INDUSTRIES†	
Industry	Estimated Waste
Men's clothing . . . . .	64
Printing . . . . .	58
Building . . . . .	53
Textile . . . . .	49
Boot and shoe . . . . .	41
Metal . . . . .	29
Average . . . . .	50

\* Adapted from *Waste in Industry*, p. 9.

† Complete waste, which, of course, is impossible, is represented by 100 points.

entirely wasteful the number of points assigned in any case must be less than 100." An examination of these estimates suggests that the manufacture of men's clothing is the most wasteful of the industries studied. Then follow in order printing, building, textile

<sup>1</sup> *Waste in Industry*, p. 3.

manufacturing, boot and shoe manufacturing, and finally the metal industry. The range of waste is from 29 per cent to 64 per cent. According to the arithmetic mean, American industry as a whole, if these six industries are representative, is but 50 per cent efficient. It seems therefore possible actually to double production.

Who is responsible for this waste? This is a question of prime importance, and a difficult one to answer. But the members of the committee have attempted the apportionment of responsibility among the various factors concerned with production and have arrived at what they regard as a fairly satisfactory result. And "responsibility," as they have used the term, "does not mean moral responsibility as ordinarily understood, but only that responsibility which arises from the undeniable fact that a given cause of waste can be removed only by a particular agency."<sup>1</sup> Taking their estimates thus determined and striking an average for the six industries, we find management responsible for 68 per cent of the waste, labor for 16 per cent, and outside contacts (including the public, trade relationships, and other factors) for 16 per cent.<sup>2</sup> These facts make it clear that vocational efficiency cannot be secured through the application of any narrow conception of vocational education. But let us examine the particular causes of waste before discussing the larger questions of policy.

The complete list of causes is a long one, and there is not space to enumerate them here. We shall be content, therefore, with a brief consideration of seven of the more important and representative ones. They are faulty material control, faulty design control, labor turnover, unemployment, idle plants and equipment, restriction of production, and lost production. A seriatim examination of these seven causes will give us a clearer idea of the character of the problem.

1. Faulty material control may be a serious cause of waste. Thus, in the shoe industry this accounts "for the greatest loss in shoe production, with the possible exception of seasonal demand and production. Firms leave it to the cutters to economize in leather. Where standards are in use, waste frequently occurs through care-

<sup>1</sup> *Ibid.*, p. 8.

<sup>2</sup> *Ibid.*, p. 9.

lessness and lack of training of cutters. The loss from idleness in shoemaking occasioned by waiting for work and materials amounts to some 35 per cent of the time."<sup>1</sup>

2. In certain industries faulty control of design greatly increases the cost of the product without enhancing its value. Three illustrations will make the point clear.

Standardization of the thickness of certain walls might mean a saving of some \$600 in the cost of the average house. . . . There are approximately 6,000 brands of paper, 50 per cent of which are more or less inactive. The duplication of brands serves no useful purpose and ties up money in unnecessary stock. . . . The standardization of newspaper columns to one size would make possible an annual saving of \$3,000,000 to \$5,000,000 on composition and plates alone.<sup>2</sup>

3. Labor turnover is a notorious cause of waste in American industry. Its extent is almost beyond credence.

The average labor turnover for the year 1920 in the metal trades plants covered (wherever record was kept, which was the case in less than half of the plants) was 160 per cent—figured in most cases as the ratio between the number of "separations" and the average number of employees on the payroll. The highest turnover was 366 per cent.<sup>3</sup>

The situation in other industries is similar; and its gravity becomes clear when it is pointed out that "in the shoe industry the cost of training an inexperienced man for cutting upper leather in a well-managed shop is \$576; for a semi-experienced man, \$450; and to install an experienced man in a different shop costs \$50. For the average shop these figures are unquestionably low."<sup>4</sup>

4. Unemployment is unquestionably one of the major causes of waste. And this cause may be broken up into a number of subsidiary causes, since men may be idle for different reasons. There is a minimum unemployment which may be regarded as "normal." The committee found that "in the best years, even the phenomenal years of 1917 and 1918 at the climax of war-time industrial activities, when plants were working to capacity and when unemployment reached its lowest point in twenty years, there was a margin of unemployment amounting to more than a million men. This margin is fairly permanent; seemingly one or more wage earners

<sup>1</sup> *Waste in Industry*, p. 10.

<sup>3</sup> *Ibid.*, p. 14.

<sup>2</sup> *Ibid.*, p. 11.

<sup>4</sup> *Ibid.*, p. 14.

out of every forty are always out of work.”<sup>1</sup> This is reminiscent of the following statement found in the report of the Federal Commission on Industrial Relations in 1916:

A careful analysis of all available statistics shows that in our great basic industries the workers are unemployed for an average of at least one-fifth of the year, and that at all times during any normal year there is an army of men, who can be numbered only by hundreds of thousands, who are unable to find work or who have so far degenerated that they cannot or will not work.<sup>2</sup>

During industrial depressions, such as we are experiencing now, unemployment is greatly increased and reaches its highest point. These “depressions appear more or less regularly at seven- or ten-year periods and each brings its increase in unemployment and wastage of the productive capacity of industry. . . . In January, 1921, a nation-wide survey of employment made by the United States Employment Service of the Department of Labor showed that there were 6,070,648 workers then employed in industry as compared with 9,402,000 in January, 1920, a decrease of 3,331,352, or approximately 35.5 per cent. This survey covered 35 states and 182 industrial cities and centers and may be considered as fairly reflecting conditions at that time.”<sup>3</sup>

There is also intermittent unemployment due to the operation of seasonal influences. Many essential industries show high unemployment regularly at certain times of the year. For example,

The clothing worker is idle about 31 per cent of the year; the average shoemaker spends only 65 per cent of his time at work; the building trade workman is employed only about 190 days in the year or approximately 63 per cent of the time; the textile industry seemingly has regular intervals of slack time; during the past 30 years bituminous coal miners were idle an average of 93 possible working days per year.<sup>4</sup>

Finally, there is unemployment due to labor disturbances. But, while conflict between management and labor is unquestionably a cause of waste, the loss due to this cause is not as great as popularly supposed. “That these disturbances do produce unemployment is true, but in the industries studied they do not of themselves appear

<sup>1</sup> *Ibid.*, p. 15.

<sup>2</sup> *Final Report of Federal Commission on Industrial Relations*, p. 34. Washington, D.C.: Government Printing Office, 1916.

<sup>3</sup> *Waste in Industry*, pp. 15-16.

<sup>4</sup> *Ibid.*, p. 16.



to constitute a major source of reduced production."<sup>1</sup> This is due to the fact that strikes and lockouts usually occur in seasonal employments, and the time thus lost is made up during what is ordinarily the slack season. As a consequence it sometimes happens that there is greater production during a year marked by serious labor disturbances than in some other year peculiarly free from conflict.

5. In many industries there is wasteful overequipment which results in idle capital. Thus,

Clothing factories are built 45 per cent larger than is necessary; printing establishments are from 50 per cent to 150 per cent overequipped; the shoe industry has a capacity of 1,750,000 pairs of shoes a day and produces little more than half that number; throughout the metal trades, standardization of products would permit of large reductions in plant and equipment.<sup>2</sup>

Likewise, economic depressions, seasonal influences, and industrial conflict result in idle capital as well as idle labor.

6. Production may be restricted by both management and labor. Restriction by the former, while recognized by the committee, is not included in their estimate of waste, because of the impossibility of measuring it with accuracy. That this may cause very serious loss of production has been recognized by many students of economics. Owners naturally consider their interests as paramount and do not hesitate to close factories and shops if by so doing profits may be increased or losses reduced. Although this means idle plants, idle equipment, idle men, and higher prices, it is immediately profitable to those responsible for the management of industry. According to Hamilton,

So far as the long-run interests of society are in harmony with the immediate pecuniary interests of social groups, they are well looked after. So far as they are contradictory to these immediate values, they are sacrificed. However these future values may be separated into the two divisions, the prevailing industrial order forces us to subordinate a conscious consideration of welfare to a consideration of wealth. It forbids wealth attending upon the behests of welfare.<sup>3</sup>

<sup>1</sup> *Waste in Industry*, p. 16.

<sup>2</sup> *Ibid.*, pp. 17-18.

<sup>3</sup> Walton H. Hamilton, "The Price System and Social Policy," *Journal of Political Economy*, XXVI (January, 1918), 66-67.

Restriction of output by labor has been much more widely advertised, although probably much less important. It is of two kinds.

On the one hand, when workers are scarce the less conscientious workers become independent and slacken speed, whereas when workers are plentiful, they work with greater diligence and care for fear of unemployment. On the other hand, the dread of unemployment is so pronounced that employees engaged in seasonal enterprises frequently restrict production in order to make employment last longer; some workers, moreover, through consideration for their fellow employees limit production to provide work for them, a practice which ultimately results in an economic loss.<sup>1</sup>

7. Much production is lost through ill health, physical disability, and industrial accidents.

The 42,000,000 men and women gainfully employed probably lose on an average more than eight days each annually from illness disabilities, including non-industrial accidents—a total of 350,000,000 days. Of the 500,000 workers who die each year, it is probable that the death of at least one-half is postponable, by proper medical supervision, periodic medical examination, health education, and community hygiene.<sup>2</sup>

On the basis of these figures the economic loss from preventable disease and death among those classed as gainfully employed is estimated at \$1,800,000,000.

The loss from industrial accidents is likewise very great.

In 1919 there occurred in industry about 23,000 fatal accidents, about 575,000 non-fatal accidents causing four weeks or more of disability, and 3,000,000 accidents causing at least one day's disability.<sup>3</sup>

The total direct cost, including medical aid and insurance, was not, in the opinion of the committee, less than \$1,014,000,000.

We are now in a position to answer the last of the series of questions raised at the beginning of this analysis of the report on waste in industry, namely, Is a higher standard of living clearly within the realm of the possible? Obviously, only an emphatically affirmative answer can be given. And we may say more than that. If we care to organize our economic life efficiently, the entire population can be raised well above the level of economic want and be liberally provided with the comforts and decencies of life. But the realization of this possibility waits upon the formulation of an adequate policy of vocational education. It remains, therefore,

<sup>1</sup> *Waste in Industry*, p. 18.

<sup>2</sup> *Ibid.*, p. 21.

<sup>3</sup> *Ibid.*, p. 22.

for us to consider certain of the educational implications of the analysis and argument presented in the foregoing paragraphs.

#### AN ADEQUATE POLICY OF VOCATIONAL EDUCATION

Let us set down in summary the main points made thus far. First, vocational efficiency must be measured in terms of the general diffusion of prosperity and the relative absence of poverty and want among the masses, rather than in terms of mechanical perfection or aggregate production. Second, while the per capita income is higher in the United States than it is in other countries, it is so unevenly distributed as to place a large part of the population on a level of subsistence below the minimum required for health and decency. Third, when judged by a standard that is far from severe, American industry is, from the standpoint of production, but 50 per cent efficient. Fourth, over two-thirds of this waste may be charged against management, while the responsibility for the remainder is borne equally by labor and outside contacts. Fifth, an examination of the particular causes of waste shows clearly that inefficiency is due largely to the fact that every modern industry is a great co-operative enterprise sustaining a host of intimate and interdependent relationships with other industries and with the larger society of which it is a part. Sixth, there is reason for believing that vocational efficiency of a genuinely human order is possible of attainment.

The policy of vocational education which flows from these facts may be stated in seven propositions. The first proposition is that *a relatively perfect system of vocational education, as currently conceived, can hardly be expected to bring about greatly increased production.* There is practically no indication in the report of waste that inadequate training on the part of the rank and file of workers is an important cause of reduced production. In so far as they contribute to inefficiency they do so by a voluntary withholding of labor through either sabotage or strike. Apparently the lack of those narrow skills and knowledges which are stressed in the vocational education of today is not a major cause of waste, for the reason, paradoxical as it may seem, that they constitute the *sine qua non* for industrial participation. Consequently, they will

be acquired in one way or another—on the job, if not through some educational agency. Obviously, increased efficiency is not to be secured by giving major attention to that type of training which is necessary if industry is to run at all, for that is already provided more or less well and will be provided in any event. The great savings and the great gains will come from attending in our public schools to those desiderata that are in danger of being neglected, namely, the less obvious, the less insistent, and the more remote.

This brings us to the second proposition. *Vocational education must recognize that the division of labor within an industry and the dependence of one industry on another for supplies or for markets have made vocational efficiency increasingly dependent on the successful co-operation of individuals and groups.* The most cursory and superficial examination of the causes of waste will establish the truth of this statement. Any policy of vocational education, therefore, that fails to give large attention to ways and means of securing effective co-operation is suffering from a serious case of myopia, if it is not actually seeking to perpetuate a tradition of vocational anarchy the origin of which antedates the rise of modern industrial society. The thing needed today is more attention to the articulation and co-ordination of the parts of our industrial machine rather than to the perfection of the parts themselves in isolation.

The third proposition grows out of the second. *Much greater care should be given to the training of those who are to occupy the managerial and directing positions.* This is obviously the weak point in industry, since the management is responsible for the great part of the waste in production. It is peculiarly the task of the management to secure that co-operation which is necessary for efficiency; so it is here especially that the lesson of co-operation must be taught. Unless the management can keep the industrial machinery running to capacity throughout the year there is little hope for greatly increased productive efficiency, regardless of the effectiveness of the training of those who perform the manual labor and specialized tasks.

The fourth proposition is an expansion of the third. *The rank and file of workers should be given that breadth of view which will*

*enable them to see their industry as a whole and the place of that industry in the larger society.* This is necessary for several reasons, of which the foremost is the fact that labor participates more or less in the management under almost any condition of industry and will apparently participate in a rapidly increasing measure in the future. Only by a thorough understanding of the industrial order can labor contribute to that type of vocational efficiency which will best serve its own long-run interests and those of society. This type of preparation is likewise justified on the narrower grounds of vocational motivation. We follow a policy of doubtful wisdom, to say the least, when the weekly wage is the only motive that holds the worker to his task. It should be pointed out that among creatures possessed of a modicum of intelligence co-operation is likely to be extended or withheld at the option of the individual and in accordance with what he conceives to be his own best interests. All of this makes especially necessary that wider view of social and industrial relationships on the part of the rank and file.

The fifth proposition is that *an adequate policy of vocational education must recognize the public as an important factor in determining vocational efficiency.* At many points the interests of those engaged in an industry come into conflict with the larger interests of society. On the one hand, we should strive for such an organization of industry as will reduce this area of conflict of interests to the lowest possible minimum; and, on the other, we should endeavor so to inform the public as to enable it to protect itself from the attacks of predatory industrial groups. There are also certain wastes that can be prevented only through the collective action of an enlightened public. Economic crises, for example, cannot be banished by the solitary efforts of isolated individuals or economic groups. Likewise, unemployment in coal mining is likely to continue as long as the public refuses to exercise foresight in the purchase of coal. Public opinion must become informed and articulate in economics as well as in politics. In neither sphere can we place complete trust in either the vested interests or a watchful providence.

The sixth proposition is that *a policy of vocational education, if it is to avoid the charge of being one-sided, must recognize the distribu-*

*tion of income as equal in importance to production itself.* It is at least conceivable that production might be greatly increased without appreciably improving the lot of the masses. Much more efficient production in American industry is certainly not incompatible with the perpetuation of economic misery. With such a short-sighted scheme of vocational education, not to employ a more damning characterization, the public school should have little to do. Yet it must be admitted that educational authorities have shown no great concern over the relation of vocational training to the distribution of income. They have assumed that, whereas production may be consciously controlled and greatly increased, distribution is a function to be left entirely in the hands of fate or to the mercy of natural laws. This sixth proposition clearly requires a breadth of understanding of economic forces that would be regarded as very impractical by many engaged in vocational education.

The seventh and final proposition may be set down as a conclusion to this whole discussion, namely, *a vocational education that emphasizes solely the narrower skills and knowledges and is separated from a broad humanism can contribute but little to genuine social efficiency.* Vocational training must be constantly examined in its broader aspects; vocational efficiency, which is ordinarily regarded as the end of such training, requires an explicit definition in terms of human welfare. The interests of the great masses of the people must be carefully safeguarded from that narrow type of training that proposes to be practical but which in fact can only promote the interests of a restricted class. The vocational problem must be seen in its relations and as a part of the larger social problem.